CLAIMS

What is claimed is:

1. A method for hermetically sealing an optical fiber comprising:
   (a) providing an optical fiber;
   (b) providing a transition bushing having a first section and a second section, the first and second sections of the transition bushing having different physical properties; and
   (c) mounting the fiber in the transition bushing.

2. The method of claim 1, wherein step (c) comprises:
   (c-1) metallizing the optical fiber; and
   (c-2) soldering the metallized fiber to the transition bushing.

3. The method of claim 2 wherein the optical fiber is metallized using at least one of plasma deposition and electroplating.

4. The method of claim 1, wherein step (c) comprises mounting the fiber in the transition bushing using a glass sealing process.

5. The method of claim 1, wherein the first and second sections of the transition bushing have different coefficients of thermal expansion.

6. The method of claim 1, wherein the coefficient of thermal expansion of a section of the transition bushing is matched to the coefficient of thermal expansion of a housing for attachment to the transition bushing.

7. The method of claim 6, wherein the section with the matching coefficient of thermal expansion and the housing are formed of welding-compatible materials.

8. The method of claim 6, wherein the section with the matching coefficient of thermal expansion is fashioned from a non-ferrous material.

9. The method of claim 8, wherein the non-ferrous material is one of a titanium alloy, magnesium alloy, and an aluminum alloy.

10. The method of claim 1, wherein steps (a)–(c) are performed substantially simultaneously.

11. The method of claim 1, further comprising mounting the transition bushing in a housing.

12. The method of claim 11, wherein the transition bushing is mounted in the housing using welding.

13. The method of claim 11, wherein the transition bushing is mounted in the housing using laser welding.

14. A method for hermetically sealing an optical fiber comprising:
(a) providing an optical fiber mounted in a ferrule;
(b) providing a transition bushing having a first section and a second section, the first and second sections of the transition bushing having different physical properties; and
(c) mounting the ferrule in the transition bushing.

15. The method of claim 14, wherein the ferrule is made of a ferrous alloy.

16. The method of claim 14, wherein step (c) comprises soldering the ferrule to a section of the transition bushing.

17. The method of claim 14, wherein the first and second sections of the transition bushing have different coefficients of thermal expansion.

18. The method of claim 14, wherein the coefficient of thermal expansion of a section of the transition bushing is matched to the coefficient of thermal expansion of a housing for attachment to the transition bushing.

19. The method of claim 18, wherein the section with the matching coefficient of thermal expansion and the housing are formed of welding-compatible materials.

20. The method of claim 18, wherein the section with the matching coefficient of thermal expansion is fashioned from a non-ferrous material.

21. The method of claim 20, wherein the non-ferrous material is one of a titanium alloy, magnesium alloy, and an aluminum alloy.

22. The method of claim 14, wherein steps (a)–(c) are performed substantially simultaneously.

23. The method of claim 14, further comprising mounting the transition bushing in a housing.

24. The method of claim 23, wherein the transition bushing is mounted in the housing using welding.

25. The method of claim 23, wherein the transition bushing is mounted in the housing using laser welding.

26. A hermetically sealed optical fiber comprising:
an optical fiber;
a transition bushing having a first section and a second section, the first and second sections of the transition bushing having different physical properties,
wherein the fiber is mounted in the transition bushing.

27. The sealed fiber of claim 26, wherein the fiber is mounted in the transition bushing through a solder joint.

28. The sealed fiber of claim 26, wherein the fiber is mounted in the transition bushing through a glass sealing process.

29. The sealed fiber of claim 26, wherein the first and second sections of the transition bushing have different coefficients of thermal expansion.

30. The sealed fiber of claim 26, wherein the coefficient of thermal expansion of a section of the transition bushing is matched to the coefficient of thermal expansion of a housing for attachment to the transition bushing.

31. The sealed fiber of claim 30, wherein the section with the matching coefficient of thermal expansion and the housing are formed of welding-compatible materials.

32. The sealed fiber of claim 30, wherein the section with the matching coefficient of thermal expansion is fashioned from a non-ferrous material.

33. The sealed fiber of claim 32, wherein the non-ferrous material is one of a titanium alloy, a magnesium alloy, and an aluminum alloy.

34. The sealed fiber of claim 26, wherein the transition bushing is mounted in a housing.

35. The sealed fiber of claim 34, wherein the transition bushing is mounted in the housing using welding.

36. The sealed fiber of claim 34, wherein the transition bushing is mounted in the housing using laser welding.

37. A hermetically sealed optical fiber comprising:
an optical fiber mounted in a ferrule;
a transition bushing having a first section and a second section, the first and second sections of the transition bushings having different physical properties,
wherein the ferrule is mounted in the transition bushing.

38. The sealed fiber of claim 37, wherein the ferrule is made of a ferrous alloy.

39. The sealed fiber of claim 37, wherein the ferrule is mounted in the transition bushing through a solder joint.

40. The sealed fiber of claim 37, wherein the ferrule is mounted in the transition bushing through a glass sealing process.

41. The sealed fiber of claim 37, wherein the first and second sections of the transition bushing have different coefficients of thermal expansion.

42. The sealed fiber of claim 37, wherein the coefficient of thermal expansion of a section of the transition bushing is matched to the coefficient of thermal expansion of a housing for attachment to the transition bushing.

43. The sealed fiber of claim 42, wherein the section with the matching coefficient of thermal expansion and the housing are formed of welding-compatible materials.

44. The sealed fiber of claim 43, wherein the section with the matching coefficient of thermal expansion is fashioned from a non-ferrous material.

45. The sealed fiber of claim 44, wherein the non-ferrous material is at least one of a titanium alloy, a magnesium alloy, and an aluminum alloy.

46. The sealed fiber of claim 37, wherein the transition bushing is mounted in a housing.

47. The sealed fiber of claim 46, wherein the transition bushing is mounted in the housing using welding.

48. The sealed fiber of claim 46, wherein the transition bushing is mounted in the housing using laser welding.